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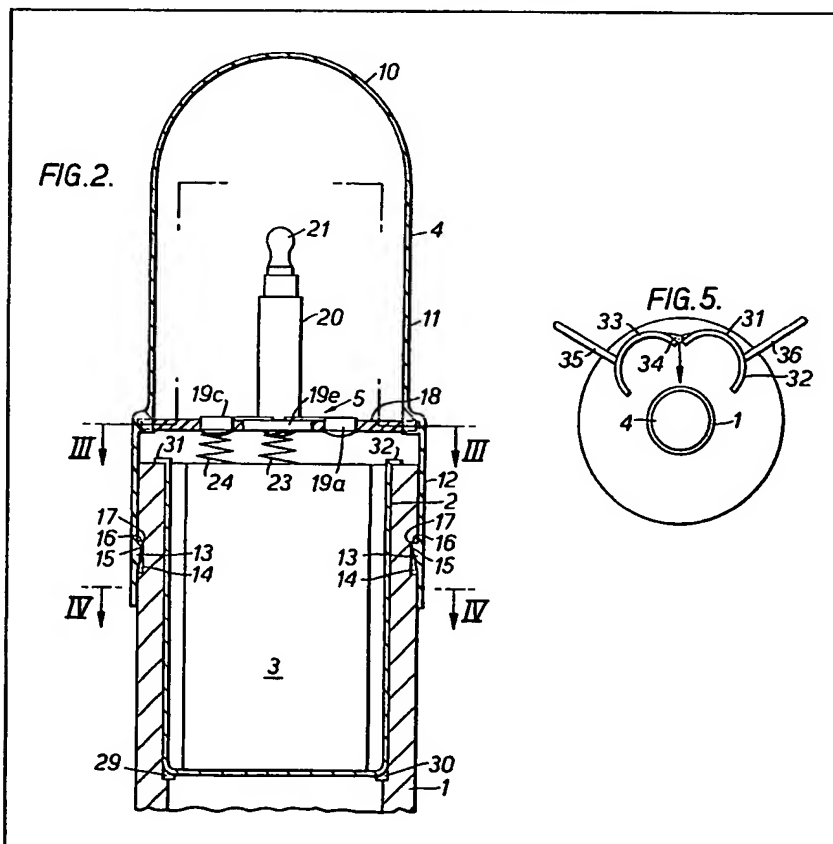
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## (54) Hazard warning lamp

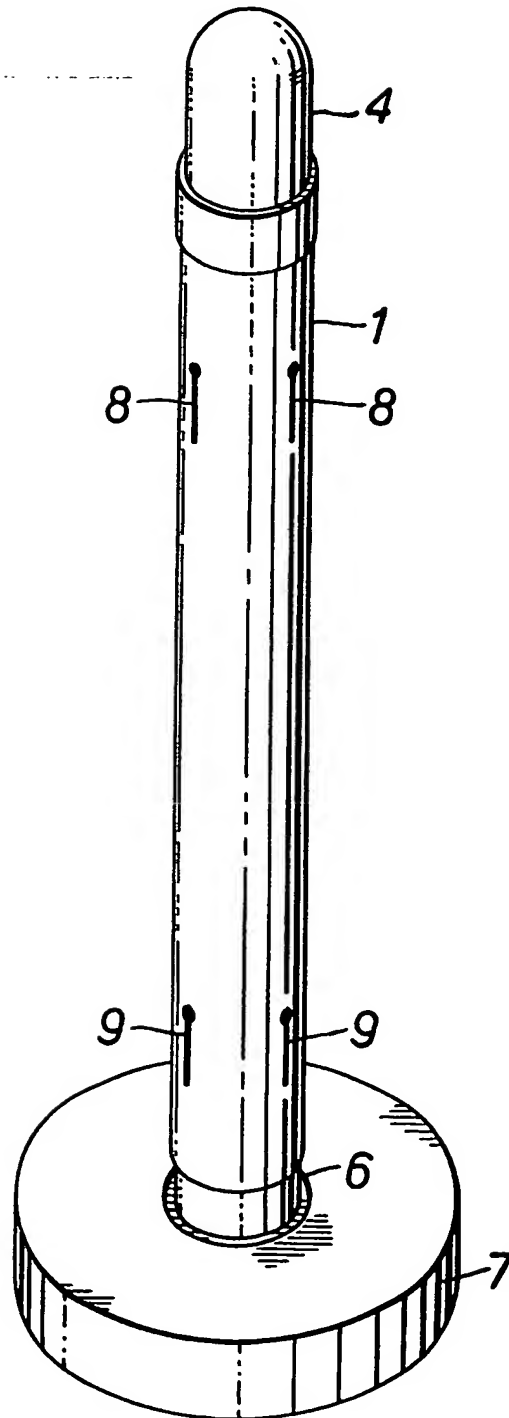
(57) A hazard warning device comprises a hollow cylindrical post 1, means such as a clip 2 for mounting a battery 3

within the post 1, a lens 4 for releasable mounting on top of the post 1 and a lamp bulb holder 5 for making electrical contact with the terminals 23 and 24 of the battery 3 so as to illuminate a bulb 21 in the holder 5. The post 1 is provided near its top end with a circumferential groove 14 to receive a corresponding circumferential tooth 13 on the internal surface of the lens 4 which enables the lens 4 to be lockably mounted on the post 1. The bulb holder 5 comprises a plastics disc 18 in which are mounted five terminal studs 19a, b, c, d and e and a lamp bulb socket 20. The holder 5 so can be rotated with the lens 4 when this is axially rotated on the post 1 to cause the studs 19a, b, c or d to make and break contact with the battery terminal 24 to illuminate and turn off the bulb 21. The post has slots to support road barriers. An extractor tool 31 which embraces the post 1 enables the lens 4 to be forced off the post for maintenance.



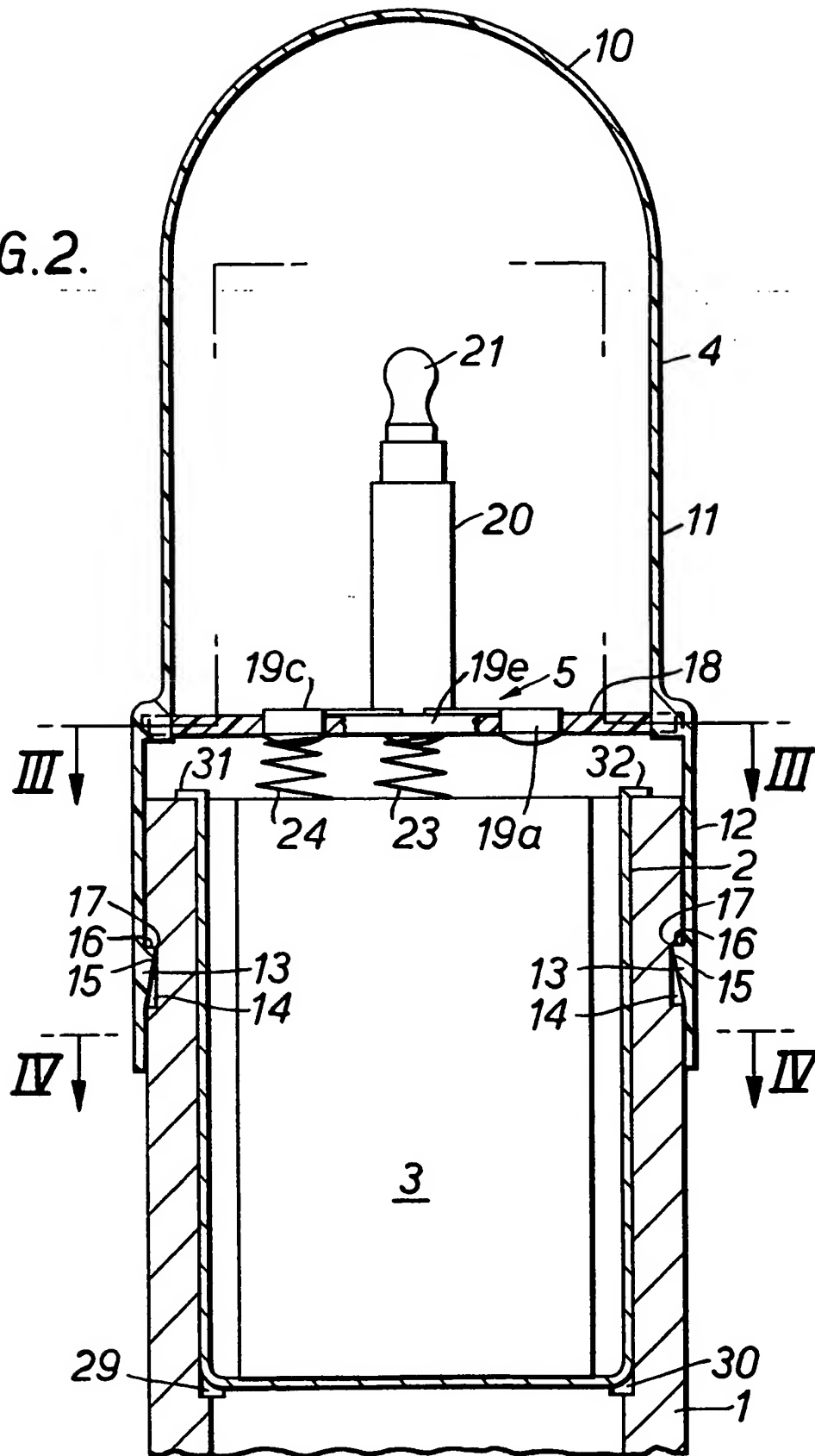
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FIG. 1.



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FIG. 2.



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FIG. 3.

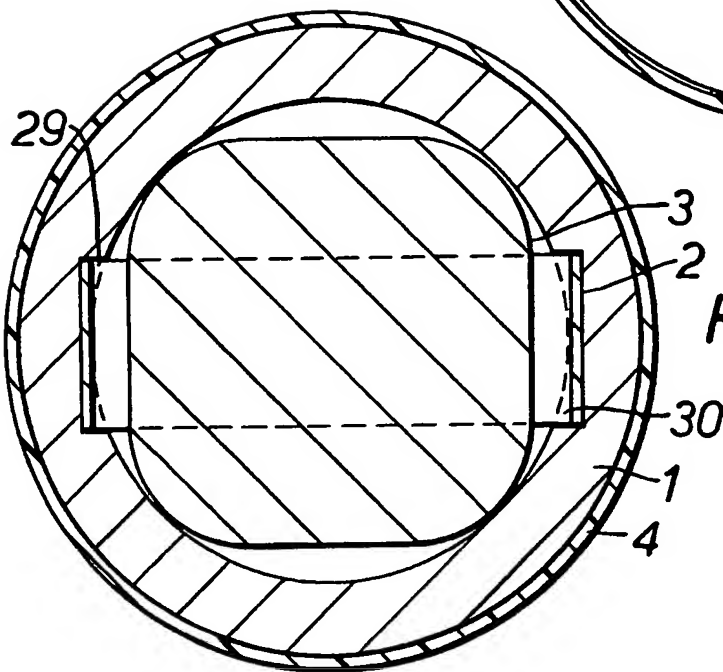
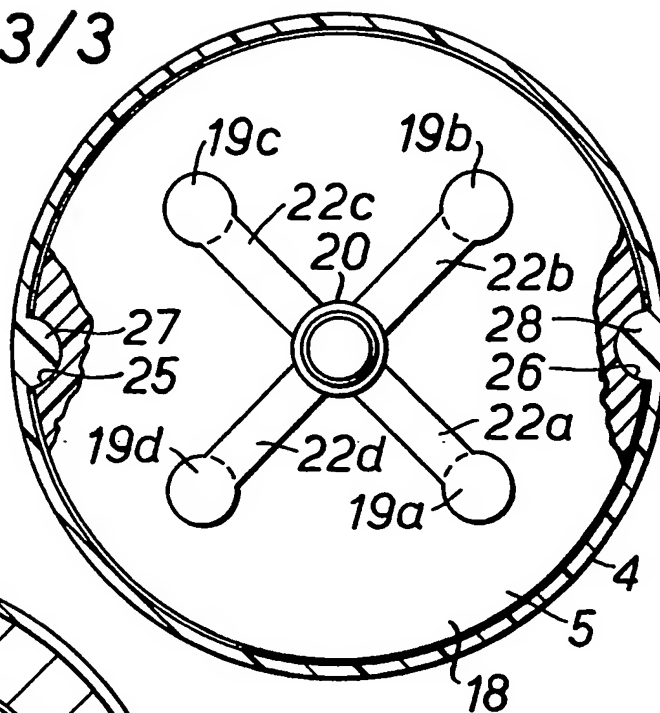


FIG. 4.

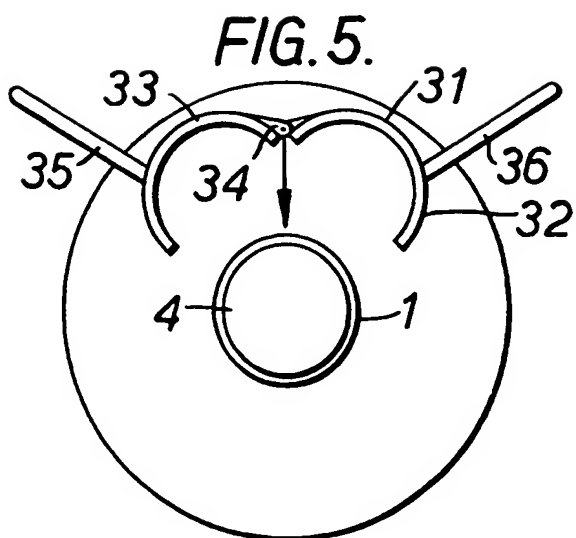


FIG. 5.

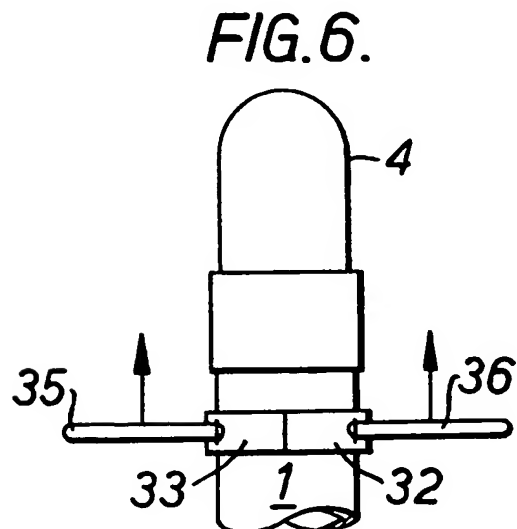


FIG. 6.

## SPECIFICATION

## A hazard warning device

5 The present invention relates to a hazard warning device to act as a warning of excavations, roadworks etc. for traffic, pedestrians and the like.

It is a statutory requirement that public utilities, such as gas and water board authorities, when undertaking major or minor repairs or replacements to mains involving excavations of roads and pavements provide a warning to the public at night of the existence of these excavations. Conventionally, portable lamps are used to warn traffic, pedestrians and cyclists and are located around the excavations.

However, since these lamps are small and readily portable, they are a frequent target for thieves and vandals and must therefore be replaced frequently and this adds unnecessarily to the cost of mains repair and replacement.

It is therefore an object of the present invention to provide a hazard warning device which is less easy to damage and pilfer than the conventional devices.

According therefore to the present invention a hazard warning device is provided, the device comprising a post, means for mounting an electrical cell within the post, a lens for releasable mounting on the top of the post and a lamp bulb holder for making electrical contact with the terminals of the cell so as to illuminate a bulb in the holder, the holder being adapted for mounting in the lens and the lens and holder being movable relative to the post when mounted thereon to enable the holder to be movable between positions respectively where contact with the terminals of the cell is made and broken.

Preferably, the lens and the post are provided with releasable locking means to enable the lens to be releasably locked on the post.

Suitably the lens and the holder are adapted to move by rotation axially relative to the post.

Conveniently the releasable locking means comprises a circumferential groove and a corresponding circumferential rib to engage in the groove and in this case preferably the post is provided with the groove and the lens is provided with the rib.

Desirably the lens has a portion which is adapted to fit over the top of the post and in this case the groove may be provided on the external surface of the post while the rib is provided on the internal surface of the lens.

Preferably the engagement between the rib and the groove is such that the lens cannot be released from the post upon the application of manual effort.

In this case an extractor tool is suitably provided to exert on the lens when mounted on the post an upward force on the lens which is significantly greater than that which can be applied manually and which is sufficient to cause the rib to become detached from the groove so that the lens can be released from the post.

The means for mounting the electrical cell within the post may comprise a U-shaped clip for mounting within the post to provide a support for the electrical cell.

Additionally means are conveniently provided to enable the holder to engage with the lens when being mounted in the lens so that the holder is rotatable with the lens.

70 Preferably such means comprise at least two circumferentially spaced recesses in the holder and at least two corresponding circumferentially spaced ears in the lens to engage in the recesses when the holder is mounted in the lens.

75 An embodiment of the invention will now be particularly described by way of example only with reference to the accompanying drawings in which:-

Figure 1 is a perspective view of the assembled device,

80 Figure 2 is a fragmentary sectional top view of the assembled device,

Figure 3 is a section on line III-III of Figure 2 showing the lamp bulb holder,

85 Figure 4 is a section on line IV-IV of Figure 2 showing a view of the electric cell mounted in the post,

Figure 5 is a plan view of the device with the extraction tool about to be placed in position, and

90 Figure 6 is a fragmentary side view of the device with the extraction tool in position ready to be used.

Referring to the drawings, and particularly Figures 1 and 2, the hazard warning device comprises essentially a lamp formed of a hollow plastics post 1, a means in the form of a clip 2 for mounting an electrical cell, such as a six volt battery 3, within the post 1, a lens 4 for releasable mounting on top of the post 1 and a lamp bulb holder 5 for mounting within the lens 4.

As shown in Figure 1, the post 1 is of circular construction and is mounted on a cylindrical protrusion 6 projecting from an otherwise solid disc-shaped plastics base 7. Alternatively the post 1 could be located in a suitable circular aperture in the base 7.

105 The post 1 is provided with a pair of four vertically displaced key-hole slots 8 and 9, only two of each four slots being shown in Figure 1. Each slot in each four is disposed at 90° to its neighbouring slot and the upper slots 8 are located immediately vertically above the lower slots 9. As is conventional, the slots 8, 9 are adapted to receive the lugs of conventional road barriers (not shown) so that these can be mounted between two posts.

Referring to Figure 2, the lens 4 is of a conventional amber-coloured translucent plastics material and is essentially cylindrically shaped with a curved or domed end 10. An upper cylindrical portion 11 of the lens 4 is integral with the domed end 10 while depending from and integral with the upper portion 11 is a lower skirt portion 12 of slightly greater diameter than the upper portion 11. The internal diameter of the lower portion 12 is such that it forms a close fit with the external wall of the post 1 when located over a top section thereof.

125 The lower portion 12 of the lens 4 is provided internally with a circumferential rib or tooth 13 for engagement in a circumferential groove 14 close to the end of the post 1. The tooth 13 has an upwardly and inwardly angled surface 15 terminating in a flat radially directed surface 16. The shape of the tooth

13 permits the lens 4 to be pushed relatively easily downwardly onto the post 1 so that the surface 16 can abut a flat upper radial surface 17 on the groove 14 which takes the form of a rectangular slot. Once in position on the post 1 therefore with the tooth 13 engaged in the groove 14, the lens 4 is locked securely on the post 1 and cannot be removed by pulling the lens 4 manually upwardly. The upper surface 16 of the tooth 13 can be slightly upwardly angled towards the lens 4 so as to enable the tooth 13 to be disengaged from the groove 14 more easily. Alternatively the tooth 13 can be of part circular shape and the groove 14 in the shape of a corresponding part-circular recess.

15 Referring to Figures 2 and 3, the lamp bulb holder 5 comprises a generally circular disc 18 of a plastics material in which are mounted five metal terminal studs 19a, b, c, d and e. One stud 19e is centrally located in the disc 18 and disposed equiangularly about the central stud 19a are four further studs 19a, b, c, and d. Mounted on the upper surface of the disc 18 is a conventional cylindrical bulb socket 20 in which, as shown, a suitable bulb 21 is mounted. Each of the four studs 19a, b, c, d is provided with terminal strips 22a, b, c, and d extending radially inwardly from each of the studs 19a, b, c and d across the upper surface of the disc 18 to connect with the base of the bulb socket 20. When located in its socket 20, the rear of the bulb (not shown) engages with a connection (not shown) extending upwardly from the terminal stud 19e. As shown in Figure 2, the studs 19 extend through the lower surface of the disc 18 so as to be engaged in use by the wire terminals 23 and 24 of the battery 3, in which one terminal 23 is centrally located in the battery 3, the other 24 being offset therefrom.

The disc 18 is provided with two diametrically opposed semi-circular slots 25 and 26 whilst internally of the lens 4 and between the upper and lower portions 11 and 12 thereof there is provided two diametrically opposed semicircular ears 27 and 28 corresponding in shape to the slots 25 and 26. The disc 18 can therefore be mounted within the lens 4 with the slots 25 and 26 engaging in the ears 27 and 28 so that the disc 18 when mounted is caused to rotate axially with the lens 4 when the lens 4 is itself axially rotated.

Referring to Figures 2 and 4, the post 1 is provided internally with a pair of vertically extending recesses 29 and 30 to receive a U-shaped clip 2. The clip 2 has uppermost flanged edges 31 and 32 to abut the end 15 of the post 1 and hold the clip 2 securely in position. As shown, the clip 2 forms a seat to locate a conventional six.

55 To assemble the lamp, the lamp bulb holder 5 (with the bulb 21) is first positioned within the lens 4. The clip 2 is then positioned in the recesses 29 and 30 in the post 1 and the battery 3 is seated within the clip 2. The lens 4 and bulb holder 5 are then slidably push fitted onto the top end of the post 1 as shown in Figure 1 until the lens tooth 13 engages in the post groove 14. At this stage the lens 4 is securely locked on the post 1. At this stage also, the bulb 21 is connected by way of the terminal stud 19e to the central terminal 23 of the battery 3. One of the outer

studs 19a, b, c or d may also be engaging the other terminal 24 of the battery 3 and if this is so the electrical circuit from the battery terminal 24 via the appropriate stud 19a, b, c or d, its appropriate terminal strip 22, the socket 20, bulb 21, terminal stud 19e and the battery terminal 23 is completed and the bulb 21 is illuminated. If one of the outer studs 19a, b, c or d is not engaging the terminal 24, the lens 4 is rotated to rotate the bulb holder 5 so that one of the studs 19 does engage the terminal 24 to complete the circuit and illuminate the bulb 21. The bulb 21 can be turned off simply by rotating the lens 4 sufficiently to cause the appropriate stud 19a, b, c or d to break contact with the terminal 24 to break the circuit.

80 Referring to Figures 5 and 6, and extractor tool 31 is provided to remove the lens 4 from the post 1 to enable, for instance, the battery 3 or the bulb 21 to be replaced or for any other purpose. The extractor tool 31 comprises a pair of semi-circular metal jaws 32 and 33 hingeably connected at one end 34 so as to be pivotally movable towards each other to form a close fitting circular collar around the external wall of the post 1. Each of the jaws 32 and 33 is provided with an outwardly extending handle bar 35 and 36 to enable the tool 31 to be manually manipulated onto the post 1 as shown in Figure 6. Once in position on the post 1 the tool 31 can be jerked upwardly in the direction of the arrows to engage the lens 4 and force the tooth 13 to become disengaged from the groove 14 so as to release the lens 4 from its locked position on the post 1. Possession of the tool 31 is therefore vital if the lens 4 is to be removed from the post 1 since the lens 4 cannot be removed by normal manual manipulation. Theft of the battery 3 or the other internal parts of the lamp is thereby prevented.

#### CLAIMS

105 1. A hazard warning device comprising a post, means for mounting an electrical cell within the post, a lens for releasable mounting on the top of the post and a lamp bulb holder for making electrical contact with the terminals of the cell so as to illuminate a bulb in the holder, the holder being adapted for mounting in the lens and the lens and holder being movable relative to the post when mounted thereon to enable the holder to be movable between positions respectively where contact with the terminals of the cell is made and broken.

115 2. Apparatus as claimed in Claim 1 in which the lens and the post are provided with releasable locking means to enable the lens to be releasably locked on the post.

120 3. Apparatus as claimed in Claim 1 or Claim 2 in which the lens and holder are adapted to move by rotation axially relative to the post.

125 4. Apparatus as claimed in Claim 2 or Claim 3 in which the releasable locking means comprises a circumferential groove and a corresponding circumferential rib to engage in the groove.

5. A device as claimed in Claim 4 in which the post is provided with the groove and the lens is provided with the rib.

130 6. A device as claimed in any of the preceding

claims in which the lens has a portion which is adapted to fit over the top of the post.

7. A device as claimed in Claim 5 or Claim 6 in which the groove is provided on the external surface of the post and the rib is provided on the internal surface of the lens.

8. A device as claimed in any of Claims 4 to 7 in which the engagement between the rib and the groove is such that the lens cannot be released from the post upon the application of manual effort.

9. A device as claimed in any of Claims 4 to 8 in which an extractor tool is provided to exert on the lens when mounted on the post an upward force on the lens which is significantly greater than that which can be applied manually and which is sufficient to cause the rib to become detached from the groove so that the lens can be released from the post.

10. A device as claimed in any of the preceding claims in which the means for mounting the electrical cell within the post comprises a U-shaped clip for mounting within the post to provide a support for the electrical cell.

11. A device as claimed in any of Claims 3 to 10 in which means are provided to enable the holder to engage with the lens on being mounted therein so that the holder is rotatable with the lens.

12. A device as claimed in Claim 11 in which the means to enable the holder to engage with the lens comprises at least two circumferentially spaced recesses in the holder and at least two corresponding circumferentially spaced lugs in the lens to engage in the recesses when the holder is mounted in the lens.

13. A device substantially as hereinbefore described with reference to the accompanying drawings.